



JRC SCIENCE FOR POLICY REPORT

RIO Country Report 2016: Slovakia

*Research and
Innovation Observatory
country reports series*

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2017

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JRC105850

EUR 28484 EN

PDF ISBN 978-92-79-65996-6 ISSN 1831-9424 doi:10.2760/072471

Print ISBN 978-92-79-69862-0 ISSN 1018-5593 doi:10.2760/227531

Luxembourg: Publications Office of the European Union, 2017

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How to cite this report: Vladimír Baláž, Karol Frank, Jana Zifciakova; *RIO Country Report 2016: Slovakia*; EUR 28484 EN; doi:10.2760/072471

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Research and Innovation Observatory Country Report 2016 Slovakia

The 2016 series of the RIO Country Report analyses and assesses the development and performance of the national research and innovation system of the EU-28 Member States and related policies.

It aims at monitoring and evaluating the EU policy implementation as well as facilitating policy learning in the Member States.

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Foreword

This report offers an analysis of the R&I system in the Slovakia for 2016, including relevant policies and funding, with a particular focus on topics of critical importance for EU policies. The report identifies the main challenges of the Slovak research and innovation system and assesses the policy responses implemented. It was prepared according to a set of guidelines for collecting and analysing a range of materials, including policy documents, statistics, evaluation reports and online publications. The quantitative data are, whenever possible, comparable across all EU Member State reports. Unless specifically referenced, all data used in this report are based on Eurostat statistics available in January 2017. The report contents are partly based on the RIO Country Report 2015 (Baláž, Zifciakova, 2016).

Acknowledgements

This report has benefited from the comments and suggestions of the Slovak Ministry of Education, Science, Research and Sport, as well as from Lorenzo Isella and Katarzyna Szkuta from Unit B.7, JRC EC. Katarzyna Szkuta has ensured the overall supervision of the process. Comments from the Directorate-General for Regional and Urban Policy (DG REGIO) and the Directorate-General for Research and Innovation (DG RTD) are also gratefully acknowledged.

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HIGHLIGHTS

- The Slovak economy experienced dynamic growth over the last decade. The average annual GDP growth was 4% over the period 2005-2015. Slovakia has a small and quite open economy. The total exports of goods and services accounted for 96.2% of the Slovak GDP in 2015.
- In 2016, the Slovak Government presented its plans for increasing public support for R&D in 2016-2019. Most of the increase should be channelled into project finance and international cooperation in the field of research and innovation (R&I).
- The National Reform Programme (NRP) 2016 sees the implementation of the RIS3 document as very significant for structural changes in the area of R&I. A higher involvement of Slovak organisations in EU and international R&D programmes is also considered a priority. The NRP refers to the need for stabilising public support to R&D and a higher engagement of the private sector in R&D activities.
- The Ministry of Finance has presented estimates of the indirect support to R&D of €372.6m for 2016-2019 in the Proposal for the Budget of Public Administration for 2016-2017.

MAIN R&I POLICY CHALLENGES

- **Improve the R&I governance.** The R&I reforms were implemented only partially by the second half of 2016. The Slovak Government Council for Research, Development and Innovations (SGCSTI) met unfrequently in 2014, 2015 and 2016. The Agency for the Structural Funds of the EU was renamed into the Research Agency and the Slovak Innovation and Energy Agency into the Technology Agency.
- **Improve the quality of the science base.** The quality of the science base lags behind the EU average in terms of research outputs. The Slovak HEIs and the Slovak Academy of Sciences (SAS) have been also decreasing in international rankings over the last three years. In the NRP 2015 and 2016, the Slovak Government presented its plans to reform the SAS and Slovak HEIs.
- **Increase private innovations outputs and R&D investments.** The European Innovation Scoreboard 2016 (EIS 2016) data indicate that Slovakia has low shares of innovative companies. The Government has developed national schemes to support start-ups and innovation vouchers. Yet, national support is low and the implementation of EU schemes behind schedule.
- **Strengthen synergies between science and industry.** The Eurostat data on R&D funding indicate weak linkages between science and industry, which are confirmed by low levels of R&I commercial outputs. Slovakia has allocated resources to strengthen synergies between science and industry in the budget of the Operational Programme Research and Innovation (OPRI). In February 2016, the Slovak Government approved the Resolution on the SRDA Programmes for 2016-2019, designing a national programme for cooperation between academia and industry over the period 2016-2020. However, any of these initiatives has not been implemented yet.

MAIN R&I POLICY DEVELOPMENTS IN 2016

- Approval of the [Resolution on the 2016-2019 Programmes of the Slovak Research and Development Agency \(SRDA\)](#) (February 2016)
- Drafting of the [Strategic document for the ex-ante conditionality and the implementation of the Action Plan for the RIS3 document in 2014-2020](#) (September 2016)

1. Main R&I policy developments in 2016

[Resolution on the 2016-2019 Programmes of the Slovak Research and Development Agency \(SRDA\)](#)

(02/2016)

The Slovak Government passed the Resolution on the SRDA Programmes in the period 2016-2019 on 24 February 2016. The preamble of the document states that the three programmes 'are linked to the RIS document' and support 'synergies with the Horizon 2020 programme. The three SRDA programmes include:

- a) The 'Support to building personnel infrastructure in all sectors of R&D' programme (€17.7m): This programme supports jobs for post-docs, reintegration grants for Slovak scientists, grants for foreign scientists and projects for 'young and excellent research teams'. The programme should speed up the career advance of postdocs, support the creation of young research collectives and promote the reintegration of individuals and small into the Slovak research system.
- b) The 'Support to private R&D and cooperation of businesses with research organisations' programme (€58.3m): This programme targets innovative and R&D-intensive firms, start-ups and spin-offs. The programme supports projects in areas of the RIS3 specialisation.
- c) The 'Support to H2020 projects' programme (€16.0m): Some Slovak projects were successful in the first round of the Horizon 2020 evaluation, but were not approved for funding in the second round of evaluation. This programme replaces the European support with national support. The programme also finances the preparation of proposals for ERC grants. This is quite a significant step, as Slovakia has obtained just one ERC grant by 2016.

[Strategic document for the ex-ante conditionality and the implementation of the Action Plan for the RIS3 document in 2014-2020](#) (09/2016)

The Ministry of Education, Science, Research and Sports has drafted the Strategic document for the ex-ante conditionality and the implementation of the Action Plan for the RIS3 document in 2014-2020. The strategic document follows the article 9 of the EU regulation 1303/2013 on the European Regional Development Fund, the European Social Fund, Cohesion Fund and European Maritime and Fisheries Fund. The strategic document defines:

- (a) a financial framework for supporting R&I under the RIS3 policy measures;
- (b) a system for monitoring and evaluating RIS3 policy measures;
- (c) activities aimed at reducing the high number of specialisation priorities and the identifying linkages between them.

1.1 Focus on National and Regional Smart Specialisation Strategies

Description and timing: The Slovak Government approved the final version of the [RIS3 document](#) with the Government Resolution no. 665/2013 on 13 November 2013. The RIS3 document lists key areas of economic specialisation: automotive and mechanical engineering industries, consumer electronics and electrical equipment, information and communication technologies and services and production and processing of iron and steel. It also defines a set of R&I policies aimed at achieving four main goals of the smart specialisation in Slovakia. Goal 1 aims at increasing the embeddedness of key industries. Goal 2 relates to support to economic growth via results of excellent science. Goal 3 focuses on creating dynamic, open and inclusive innovative society. Goal 4 focuses on improving the quality of human resources. The RIS3 document also identified five research priorities for public expenditure on basic and applied research: material research and nano-technologies, information and communication technologies,

biotechnologies and biomedicine; agriculture and environment and sustainable energy sector.

New developments: The Ministry of Education, Science, Research and Sports (MESRS) drafted the Strategic document for the RIS3 ex-ante conditionality and the Report on the implementation of the Action Plan for the RIS3 in 2014-2020 (European Commission, 2016). The document includes a financial framework with an indicative budget for national support to all R&I activities in 2016-2019 and indicative budgets for policy measures for the period 2016-2020. The document mentions some potential major improvements in national financing, including: the reintroduction of state R&D Programmes, increased resources for membership in international bodies and increased outlays on R&D stimuli and R&D tax deductions for R&D. The document refers to the need of reforming the R&I financing system. It confirms the intention of the Government to introduce a mandatory indicator on the share of public support to R&D. The support should increase each year by 0.04% of GDP, from 0.35% of GDP in 2015 to 0.50% of GDP in 2020. As for the support structure, some additional resources should go to project finance. The Government reviewed the state of the ex-ante conditionality at the end of September 2016. The review included the ex-ante conditionality on R&D and the strategic document. The review concluded that there is high risk of not achieving the ex-ante conditionality in R&D.

Outstanding issues: The Action Plan for the RIS3 is still pending. The Slovak Government has rejected the first two versions of the Action Plan. The major difficulties relate to the reform of R&I governance. The final draft of the Action Plan was approved by the Slovak Government Council for the Science, Technology and Innovation (SGCSTI) on the 4th of September 2015 and sent out to the European Commission (Directorate-General for Regional and Urban Policy) for further comments. This draft concentrated on legislative measures aimed at the reform of funding agencies, the transformation of the Slovak Academy of Sciences, the reform of higher and secondary education, the introduction of a new system of measures to support R&I policies, the introduction of an evaluation framework for the RIS3 and the preparation of a national ESFRI Roadmap. The Ministry of Education, Science, Research and Sports (MESRS) has drafted the Strategic document for the ex-ante conditionality on the implementation of the Action Plan for the RIS3 for 2014-2020. The RIS3 Action Plan, including relevant aspects for ex-ante conditionality fulfilment is not yet satisfactory, but the required changes are expected to be negligible.

2. Economic Context

2.1 Structure of the economy

The Slovak economy has a dual structure¹. The branches of multinational companies (MNCs) in the automotive and consumer electronics sectors are the 'backbone' of the Slovak economy and generate the majority of Slovak exports. SMEs are less significant for Slovak exports, but they have a weighty role in the national economy.

SMEs generated 53.3% of the total Slovak value added in 2014. The share of SMEs in the total value added remained stable during the period 2009-2014. Enterprises with up to 9 employees are by far the most common type of enterprise in Slovakia accounting for 79.3% of the total enterprises in 2000 and 96.6% in 2014. (Eurostat, 2014)

The service sector accounts for the majority of the total employment in Slovakia, yet the Slovak economy is characterised by high shares of manufacturing and high and medium high tech manufacturing in the total employment (21.55% and 7.47% respectively in

¹ Dual economy (Boeke, 1953) refers to an economy in which rich, capital-intensive modern sectors exist in the same model as comparatively poor, traditional, labour intensive sectors. Please see - J.H. Boeke (1953) Economics and Economic Policy of Dual Societies, New York: Institute of Pacific Relations.

2014). Furthermore, in 2014, the share of knowledge-intensive service sectors in the total employment was slightly lower in Slovakia (33.0%) than in the EU28 (36.9%). (Eurostat, 2014)

The Eurostat data on labour productivity indicate that the productivity in Slovakia has grown by 10.8%, compared to 4.5% in the EU28 in the period 2010-2014.

2.2 Business environment

The Slovak business environment is characterised by a high degree of volatility. It accounted for frequent changes of the law on taxation, business licensing and information obligations. The country provides a relatively good tax environment for venture capital investment. It makes no distinction between regular income and capital gains and does not apply any municipal or local taxes.

Slovakia does not apply taxes on dividends. The government announced in summer 2016 its plans to introduce a flat 15% dividend tax, abolish health insurance payments from dividends and introduce an additional tax levy for monopolies and/or large firms in financial services and telecom sector as of 2017. The Government also intends to abolish the mandatory minimal taxes for companies ('tax licenses') since 2018 and decrease corporate income tax from 22% to 21% since 2017. The abovementioned plans were discussed by the Parliament in autumn 2016, but are not approved yet.

The 2015-2016 Global Competitiveness Report ranked Slovakia 67 out of 140 countries. The report reveals that Slovakia is doing well in the availability of new technologies, FDI and technology transfer, quality of infrastructure, macroeconomic environment and business sophistication, while the most problematic factors for doing business including corruption, inefficient government bureaucracy, restrictive labour regulations and complexity of tax regulation.

According to the European Central Bank's SAFE Survey which provides information on the access to finance of companies in the EU, 8% of Slovak respondents perceive access to finance as most problematic. On the contrary, 28% of the Slovak respondents stated as the most important problem the availability of skilled staff or experienced managers. (Survey on the access to finance of enterprises (SAFE), European Commission, 2015).

2.3 Supply of human resources

Slovakia accounts for a sufficient supply of human resources (number of researchers and doctorate students), but this does not translate into a high quality of outputs by the national innovation system. In 2014, the number of researchers per thousand of population was somewhat lower in Slovakia (4.63) than in the EU28 (5.34). In 2014, Slovakia accounted for a relatively low share of researchers employed in the business sector (17.9% vs - 48.4% for EU28 in 2014).

The Eurostat indicates that in 2014 Slovakia had 2645 researchers employed in the business sector. The researchers in the business sector accounted for 0.113% of the total employment in 2014. The share of women researchers was higher in Slovakia (42.26%) than in the EU28 (33.17%).

3. Main R&I actors

The Ministry of Education, Science, Research and Sports (MESRS) is responsible for drafting and implementing policies on basic and applied research. The MESRS manages the funding agencies for basic research (VEGA grant agency and KEGA Grant Agency), applied research (the Slovak Research and Development Agency SRDA) and the Research Agency and manages the funds for higher education institutions. MESRS manages the support of R&D in the business environment of SMEs through incentives for R&D and also manages strategic research and development programs supported by the state budget through state R&D programs (in 2016 €6.7m). The Ministry of Economy

manages the Slovak Business Agency (SBA), the Slovak Investment and Trade Development Agency (SARIO) and the Technology Agency. In 2016, there were 35 higher education institutions (HEIs) in Slovakia, out of which 20 were public.

The private non-profit sector accounted for a modest level of R&D activities. The Eurostat data indicate that the resources allocated to this sector were €3.5m in 2014.

Cluster policies are relatively new in Slovakia. They were developed and implemented by the Ministry of Economy, but received modest funding from national resources. In 2016, Slovakia had nine technology and five tourism clusters.

4. R&I trends

The gross expenditure on research and development (GERD) accounted for 1.18% GDP in 2015 (compared to 0.88% in 2014). The increase of the indicator relates to a higher spending from the ESIF and a low value of the GDP deflator. The most important source of funding is the government, followed by the business and the non-profit sectors, with a still very significant contribution of the EU funding schemes. The Operational Programme Research and Innovation (OPRI) is a major source of finance for the Slovak R&I sector in 2014-2020. In total, the OPRI provides €3,988 m, out of which €2,226m from the ERDF.

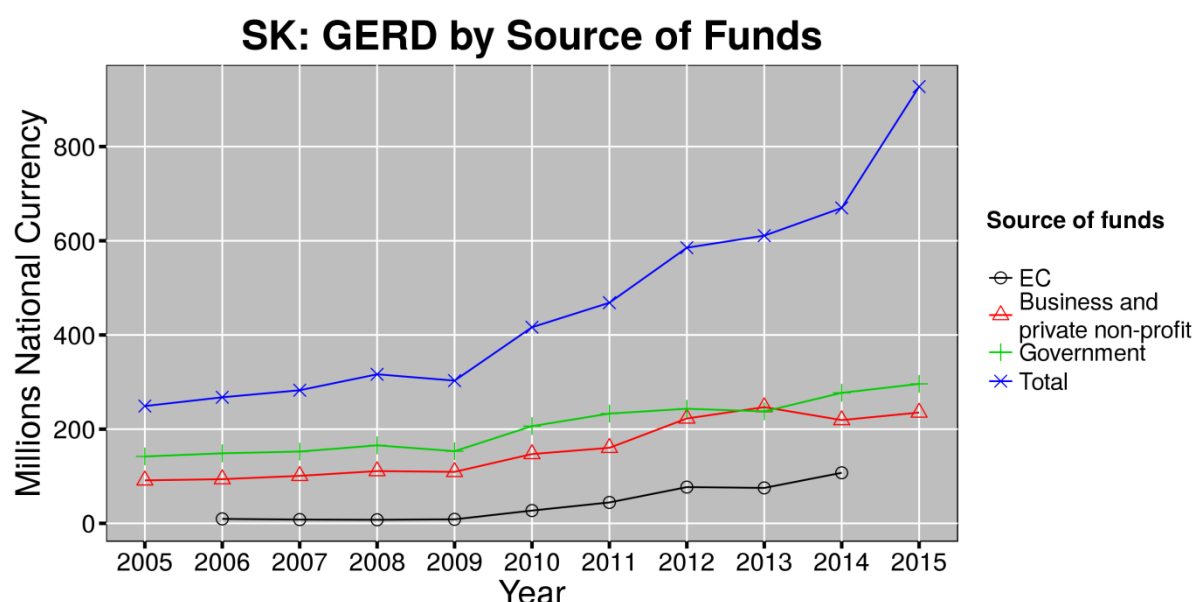


Figure 1 Breakdown of sectoral contributions to total GERD funding.
Data source: Eurostat, November 2016.

4.1 Public allocation of R&D and R&D expenditure

The government support to R&D (measured via the government budget appropriations or outlays for research and development, GBAORD) is still considerably below the EU28 average of 0.64%. In 2015, the Slovak GBAORD accounted for 0.36% of the GDP. The GBAORD increased significantly over the period 2007-2011, but decreased after 2011 due to budgetary cuts related to the financial crisis.

The Eurostat data on GBAORD by funding mode indicate that institutional funding accounted for 76.3% of the total government support to R&D in 2015. The share of project funding in the total government funding was the second lowest in the EU28 area.

A substantial part of the total project funding was channelled to membership fees for international science and technology organisations. In 2016, the HEIs financed partly 1279 projects (€9.4m) and the Slovak Academy of Sciences (SAS) financed partly 947

projects (€4.52m). The KEGA funded 444 projects (€2.5m) in culture and education in 2016. The 2016 State Budget Law set project funding for the SRDA to €29.3m.

4.2 Private R&D expenditure

The business expenditure on R&D (BERD) increased from 0.18% to 0.33% GDP in 2007-2015, but remained significantly lower than the EU28 average (1.30% GDP). The volume of research funded by the government and performed by the business sector was also significantly lower in Slovakia (0.01% GDP) than in the EU28 (0.09% GDP).

The low level of the BERD and the limited cooperation between the public research sector and the business sector was reflected in the innovation mode of Slovak SMEs for which non-R&D and non-technological innovations were more important than R&D-based innovations.

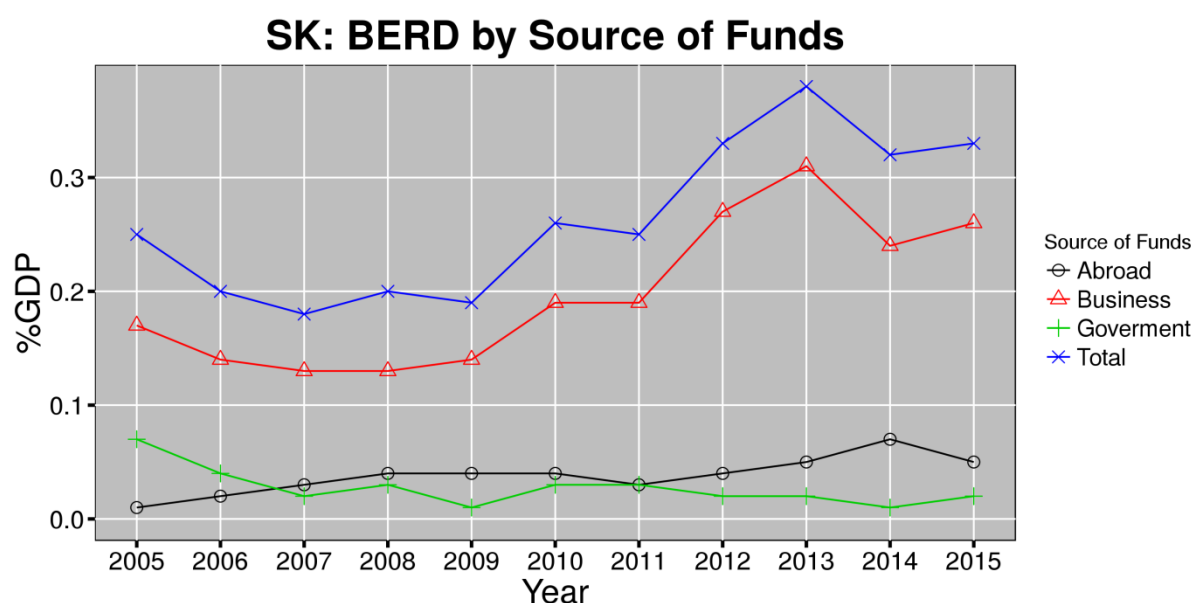


Figure 2 Breakdown of sectoral contributions to total BERD funding.
Data source: Eurostat, November 2016.

The OECD data on growth rates of the high-growth enterprises and 'gazelles' indicate that Slovakia performs quite well. High-growth companies account for high shares in the most important sectors of the economy, including manufacturing (10.1%) and ICT services (14.7%) in 2014. Slovakia also accounts for high shares of 'gazelles' in manufacturing (2.2%) and ICT services (4.1%). (OECD: Entrepreneurship at a Glance, 2014)

The Statistical Office of the Slovak Republic provides data on the technological intensity of Slovak SMEs. Some 3.1% of SMEs were active in the high-tech and 13.9% in the medium-high manufacturing industries in 2014. As for the service industries, some 35.1% of Slovak SMEs were active in the knowledge-intensive services in the same year. (The Statistical Office of the Slovak Republic, December 2016).

The 2016 EIS indicates that Slovakia performs modestly in all indicators related to linkages and entrepreneurship and intellectual assets. The shares of SMEs innovating in-house accounted for 52%, shares of innovative SMEs collaborating with others for 65% and numbers of public-private co-publications (per million of population) for 24% of the EU28 averages (European Commission, 2016).

The number of PCT patents applications per billion GDP (in PPSE) accounted for 18%, the number of PCT patent applications in societal challenges for 9%, numbers of community trademarks for 49% and community designs for 34% of the EU28 averages (Eurostat, November 2016).

4.3 Public sector innovation and civil society engagement

The data on public sector innovation (from ESTAT 2016, OECD, World Bank, EVCA) indicate that Slovakia lags behind in the online availability of public services, government procurement of advanced technology and quality of e-government. The Slovak Government did not draft yet any policies for public procurement of innovative technologies and services.

The quality and transparency of government services are problematic and public sector modernisation agenda overlaps with the efforts oriented on fighting corruption and increasing the quality of government services.

The Slovak Government has introduced several initiatives aimed at increasing efficiency and transparency of the government services. Since 2011, public institutions are bound to publish their all their contracts on the web. Since February 2015, public institutions have to use the Electronic Contract System (ECS) to procure goods and services over €1000 since February 2015.

The Slovak Government has used the Operational Programme Information Society (OPIS) to support development of the e-government services in period 2007-2013/2015. Slovakia spent 93.7% of the OPIS budget (€1592.8m) by the end of 2015,. However, many e-government projects have failed.

Civil society innovation is only starting to develop in Slovakia. It is focusing on non-profit initiatives promoting innovation among young people and support for an emerging start-up community which has developed in the recent years. This community is centred on start-up hubs, co-working places and other arrangements, which provide space for supporting new and innovative ideas, products and services.

5. Innovation challenges

5.1 Challenge 1 Improve the R&I governance

Description

The competences for developing and implementing R&I policies are fragmented between two ministries who account for a low level of coordination – the Ministry of Education, Science, Research and Sports (support to R&D) and the Ministry of Economy (support to innovation). In 2013, the Slovak Government established the Slovak Government Council for Research, Development and Innovations (SGCSTI). This high-level structure should bring together all the main ministries responsible for R&I policy. The SGCSTI has helped drafting strategic documents on R&I policies (including the RIS3), yet it is only an advisory body to the Slovak Government and has no executive powers.

There are no clear regional R&I policies in Slovakia since R&I is considered traditionally a matter of the central government and the degree of regional institutional autonomy is very low. The Slovak laws on self-governing regions list the competences of regional governments which do not make any reference to research and innovation.

Policy response

The RIS3 document has indicated some extensive plans for reforming R&I governance in the programming period 2014-2020, though the approval of its Action Plan is pending. The final draft of the Action Plan was approved by the Slovak Government Council for the Science, Technology and Innovation (SGCSTI) on 4 September 2015 and sent out to the European Commission (Directorate-General for Regional and Urban Policy) for further comments. The RIS3 Action Plan, including relevant aspects for the ex-ante conditionality fulfilment is not yet satisfactory, but the required changes appear to be minor at this stage.

The National Reform Programme (NRP) 2015 foresaw significant changes, including the merger of funding agencies into the Agency of Research and the Agency of Technology, as well as the transforming of the Slovak Academy of Sciences (SAS) institutes, budgetary and subordinate organisations into public research institutes (PRI). The eight government agencies which are implementing R&I support schemes were expected to be merged in two agencies and the Slovak Government should prepare a new law on PROs.

The National Reform Programme (NRP) 2016 foresees that after the adoption of the RIS3 Action Plan, the implementation of individual measures will begin, aiming at establishing structural changes in science and research. The measures will be mainly focused on the targeted use and stabilisation of public funds and support for the engagement of the private sector in R&D activities and the financing will be focused on increasing the quality of research, promoting the infrastructure built from EU funds and connecting universities, science academies, research institutions and partners from industry.

The Ministry of Education, Science, Research and Sports (MESRS) has drafted a strategic document for meeting the ex-ante conditionality for the deduction and implementation of the Action Plan for the implementation of the RIS3. The document introduces monitoring and evaluation systems for the RIS3 document for the years 2014-2016 and envisages thematic and impact evaluations. The thematic evaluation targets specific themes as infrastructure, technology transfer, international cooperation, innovation performance, IPR protection and SMEs development.

The Slovak Government renamed the Agency for the EU Structural Funds into the Research Agency and the Slovak Innovation and Energy Agency into the Technology Agency in 2015.

Policy Assessment

The R&I governance remains fragmented among a number of ministries and implementing agencies. The lack of coordination and dispersion of restricted financial resources is limiting the synergies of Slovak R&I policies. The reforms of the R&I system were only partially implemented by the end of 2016. The SGCSTI met infrequently in 2014, 2015 and 2016. The renaming of the agencies dealing with R&I may constitute a progressive step, since the new names suggest that there will be more focus on R&I, though, at this stage, their number and their structure has remained the same.

The merger of funding agencies was announced last year, but it is not implemented yet and the reform of the SAS was delayed until 2017. The eight regional governments have drafted their own Regional Innovation Strategies by 2015, but they have limited resources to support regional R&I policies. The impact of these strategies is limited as the central government may consider the targets and policy tools suggested by regional innovation documents, but is not bound to adopt them. So far, no policy document has considered doing changes in the layout of competences between the central and the regional governments.

5.2 Challenge 2 Improve the quality of the science base

Description

The Slovak R&I system has experienced a profound decline over the 1990s and 2000s. The decline was visible in decreased R&D funding, diminishing numbers of researchers and lacking structural reforms of the public research sector. The reduced resources and a lack of interest of Slovak policy makers might have translated into low outputs of the R&I system in terms of high-quality publications, numbers of innovating enterprises, production and intellectual assets and exports of the knowledge-intensive services.

Slovakia ranks among the more modest research performers in the EU, demonstrated by indicators such as the percentage of the top 10% most highly cited publications for the

period 2000-2013 (5.73% compared with 7.34% in the Czech Republic) and the total number of patent applications by the Patent Cooperation Treaty (48 compared to 168 in the Czech Republic). The Research Excellence Composite Indicator places Slovakia markedly behind top EU Members States in terms of research excellence, but the country's performance has improved notably since 2007.

Policy response

Since 2007, Slovakia has been able to make use of Structural Funds for R&I and has benefited from the EU assistance to R&I policies. These investments concentrated in infrastructure projects, but were not matched by national investments to institutional and project funding. The EU support was channelled to modernising incumbent and building new research infrastructure (some 13 university research parks and R&D parks, 67 centres of excellence and 8 competence centres) in 2007-2013. The national and European support measures for R&I vastly differ in their size and focus. The financial schedule for the OPRI, for example, envisages support to R&I policy measures €3,599.6m by the ESIF and €678.9m by the national public resources in 2014-2020.

The state budget resources primarily target institutional support to public HEIs and PROs. The national project finance for the R&D collaboration by industry and academia provides about €12m per year via the SRDA schemes. The national funding also allocates several thousand of Euros to innovation vouchers and cluster policies.

The strategic document for meeting the ex-ante conditionality for the deduction and implementation of the Action Plan for the implementation of the RIS3 foresees significant increases in public support to R&D. The document mentions a preference for project-based funding and indicates an increased support for international cooperation in R&I.

Policy Assessment

The Slovak Government designed several reform programmes aimed at strengthening the focus from basic to applied research. However, the implementation of these reforms is slow and hesitant. In terms of research outputs, the quality of the science base lags behind the European average. The Slovak HEIs and the SAS have been slipping down in international rankings over the past three years and account for much lower places in international rankings than their Czech and Hungarian counterparts.

The Slovak Government drafted and rejected three versions of the Action Plan for the RIS3 strategy in the period 2015-2016. Some key organisational reforms have not been implemented by the end of 2016. However, the Slovak Government and the Accreditation Commission closed some low-quality HEIs and abolished a substantial number of low-quality study programmes.

5.3 Challenge 3 Increase private innovation outputs and R&D investments

Description

The 2016 EIS data indicate that Slovakia has a low share of innovative companies and this has decreased over the last three years. The Slovak economy accounts for a dual structure (foreign multinational companies (MNCs) versus domestic SMEs), which has a significant impact on the private spending on R&D. The dual structure is reflected in the low intensity of BERD, low shares of SMEs innovating in-house and low numbers of patents, industrial designs and other commercial results of research and innovations.

There were some 180.000 domestically-owned SMEs in Slovakia in 2016. The Slovak SMEs base their business model on cost competitiveness and marketing and organisational innovations. The R&D-intensive innovations are rare, mostly because SMEs are risk averse. The shares of the process and product innovators have been rising between 2004 and 2015, but remained well below the EU average.

The branches of MNCs based in Slovakia have high productivity, but lack in-house research activities. The high-tech and high-value sector of the MNCs remains relatively isolated from domestic SMEs. The MNCs tend to bring their supplier chains from abroad. As for the knowledge-intensive activities, MNCs keep their R&D centres, design, marketing and other business services in their headquarters. No MNC has built its research centre in Slovakia so far. The MNCs have also a limited interest in cooperating with Slovak HEIs and PROs.

Policy response

Measures to support innovation-oriented enterprises and the emergence of start-ups were adopted in 2015 and 2016. A law introducing additional tax deductions for private companies investing in R&D entered into force in January 2015. The new tax deduction allows companies investing in R&D to reduce their tax bases with an additional 25% of their R&D expenditure, 25% of their wage for R&D employees and 25 % of the yearly R&D expenditures increase.

On 30 August 2016, the Ministry of Economy published a proposal for the Smart Industry Concept for Slovakia. The concept mentions that the state itself will play an important role in meeting the expectations of Smart Industry by adopting innovation-friendly legislation and proposes to analyse the option of increasing further the deductible amount of R&D costs.

Policy Assessment

The Slovak Government has developed national schemes to support start-ups and innovation vouchers to improve SMEs' competitiveness. However, the support from the national sources is very low and the implementation of the schemes of the Operational Programme Research and Innovation (OPRI) is behind schedule.

Slovak companies do not use extensively the new tax deduction introduced in January 2015. This is most likely because of a lack of clarity of the legislative definition, which may constitute an obstacle for companies willing to apply for it. The law stipulates that in order to obtain a tax deduction and reduce 25% of their wage for R&D employees companies should hire employees that are younger than 26 years and no longer than 2 years after graduation and only a few young R&D employees can match these criteria (except IT specialists).

The proposal for the Smart Industry Concept for Slovakia shows the undertaking of the Slovak Government to establish a significant national initiative aimed at transforming and strengthening its industry via investments in research and innovation and support to industry-academia cooperation. The proposal is so far only a strategic document which waits for a further follow-up with measures and action plans.

5.4 Challenge 4 Strengthen synergies between science and industry

Description

The European and national investments to collaborative research projects between academia and industry were considerably lower than those in infrastructure. The business and the public sector are largely isolated. Businesses tend to fund business projects while the state support is channelled to HEIs and public research organisations (PROs). The business to HEIs/PROs flows accounted only for 3.2% of the total flows in 2014. The national funding concentrates on institutional funding and mostly targets non-oriented research and general university funds.

The SRDA runs several collaborative schemes for Slovak businesses and HEIs/PROs. However, the SRDA's total budget is low and the national project funding is dominated by the EU support to research infrastructure and the national institutional support.

The cooperation between academia and industry is also slowed down by the low interest of Slovak SMEs in R&D-oriented innovation. The CIS 2012 Survey indicates 50.1% of innovative companies engage in any type of cooperation (above the EU average of 31.3%). Yet, only half of them (25.4%) cooperate with universities and higher education institutions and only 19.4% cooperate with government or public or private research institutes. (The Community Innovation Survey (CIS), 2012). The CIS 2012 data indicate that Slovakia has low shares of innovative SMEs, and the innovative Slovak SMEs concentrate on the reduction of production costs, and organisational and marketing innovations, rather than R&D-intensive products.

Policy response

The OPRI launched 10 calls in the period 2014-2016, out of which two supported the second phase of university science parks (€17.7m + €5.9m), one targeted building industry R&D centres (€200m), and one invested €218m in strategic research in the areas of specialisation of the RIS3. The Smart Industry Concept for Slovakia approved in August 2016 puts a lot of emphasis on the need for research facilities and research institutions to conduct research with commercialisation ends to serve better industry needs, especially via PPP projects, as it was already done in other EU member States.

Policy Assessment

The recent evaluations point to several reasons for the low level of synergy between science and industry. The low absorption capacity from the demand side may result from a large number of SMEs with limited innovation capacities and the preference for technology import both in the case of multinationals and domestic companies. The low interest from the supply side may be due to insufficient incentives for researchers involved in knowledge transfer activities, little support for business creation and development of spin-off companies, a limited familiarity of R&D institutions with the business sector cooperation possibilities and weak patenting and licencing performance.

The Slovak Government earmarked significant resources to strengthen the synergies between science and industry in the OPRI budget. The Government also designed a national programme of the SRDA for the cooperation between the academia and industry in the period 2016-2020. Yet, none of these initiatives has been implemented yet.

The approval of the Action Plan to implement the RIS3 is still pending. Its endorsement is essential for the implementation and the financing of measures aimed at research results commercialisation and the fostering of science-academia collaboration. The Smart Industry Concept for Slovakia intends to assess the current performance of academic research in terms of industry needs. This can constitute a promising step to foster synergies between science and industry and improve research results commercialisation.

6. Focus on creating and stimulating markets

This section aims at describing and assessing national level efforts to introduce demand-side innovation policies to stimulate the uptake of innovation or act on their diffusion, including public procurement and regulations supporting innovation. It also analyses policy measures aimed at internationalisation of companies with the aim of increasing the innovativeness of the economy.

One of the main instruments focused on stimulating and creating markets is public procurement of innovative goods and services. It includes demand driven innovation measures as pre-commercial procurement, technology-oriented procurement as well as lead users and matching between supply and demand measures. The lack of clear national policies and targets for public procurement of innovative goods and services and excessive reliance on the EU resources have an impact on the efficiency of innovative public procurement in Slovakia. However, a project for the support of PPIs and PCPs is being prepared and its activities should start in late 2016.

Examples of innovative public procurement include:

- The infrastructure for research and development: The measure stipulates that public sector should build an efficient ICT infrastructure for R&D in the period 2009-2013. The infrastructure should be able to store and provide data for R&D workers with a high degree of availability and security. Fast and reliable broadband networks, solutions for efficient information use and processing, and Intranet and Internet solutions are also parts of the ICT infrastructure.
- The Electronic Identity Card project (eID): The project enabled the issuing of ID cards with built-in chips from December 2013. By June 2014, some 281,000 eID cards were issued. The government guaranteed the low price of the eID card (€4.50) and ensured the free distribution of card readers and respective software solutions. About one half of the eID card holders opted for the activation of digital signature which simplifies dealings with many public administration services.
- The e-Health project: The project was approved via Slovak Government Resolution No 497/2008 of 16 July 2008 and the deliverance of outputs was redefined into three phases.

The 2013 European Public Sector Innovation Scoreboard gave Slovakia low marks in most components of the Public Innovation Scoreboard. The 2014-2015 Global Competitiveness Report released by the World Economic Forum ranked Slovakia no 117 in the government procurement of advanced technology products among 143 countries.

The Slovak Government approved the Law 546/2010 which sets out that all contracts and purchases made by departments and agencies of the central, regional and local governments should be published on the internet not later than 10 days after the purchase. However, contracts are treated differently – the information on financial transactions should be published in a structured way and enable an easy identification of the relevant actors and the expenditures involved. The Central Register of Contracts works well and helps increasing the transparency of public procurement in Slovakia.

The Operational Programme Research and Innovation (OPRI), which is a major source of finance for the Slovak research and innovation system in 2014-2020, makes no reference to public procurement of innovative technologies. The OPRI mentions briefly state aid schemes would prioritise the procurement of top-notch technologies according to RIS3 goals.

According to European Commission data, Slovakia lags behind the EU average by a large margin as regards the principles of the Small Business Act (SBA) – internationalisation (benefit from the growth of markets outside the EU). It ranked last among all EU Member States. As regards the single market principle (greater benefit from the opportunities offered by the Single Market), Slovakia achieved better results, but these were still below the EU average. (SBA Factsheet: Slovakia, 2014)

There have been many steps undertaken in support of Slovak SMEs' internationalisation in recent years. However, the exports of SMEs in 2014 only represented 29% of the total exports of Slovak companies. Only 5% of SMEs undertake exports in Slovakia (compared to 64% of large companies). Over 89% of Slovak SMEs' exports were intra-EU (compared to 81% for large companies). Over 10% of SMEs' exports were outside the EU (compared to 19% for large companies). (Going global remains a challenge for Slovak SMEs, AmCham, 2014)

References

- Balog, M. (2015): The Cluster Policy in Slovakia, Bratislava, Slovak Innovation and Energy Agency
- Balog, et al (2015): The Automotive Industry in Slovakia and Global Value Chains, Bratislava: The Slovak Innovation and Energy Agency
- Balaz, V. (2015) RIO Country Report 2014: Slovak Republic, Brussels, European Commission Joint Research Centre.
- Balaz, V., J. Zifciakova (2016): RIO Country Report 2015: Slovak Republic, Brussels, European Commission Joint Research Centre.
- Slovak Government (2015): Concept paper for the support of start-ups
- EC, European Commission (2016): Innovation Union Scoreboard 2016, European Commission, Directorate-General for Enterprise and Industry
- EC, European Commission (2016): Survey on the Access to Finance of Enterprises in the euro area October 2015 to March 2016
- EC, European Commission (2016): European Innovation Scoreboard 2016
- Eurostat (2016): statistics database
- OECD (2015): Trade in Value Added (TIVA)
- SBA, Slovak Business Agency (2015): Support to small and medium businesses in the Slovak Republic. Guide to initiatives, Bratislava, August 2015
- Slovak Government (2013): The 2012 Annual Report on R&D
- Slovak Government (2014): 'The 2013 Annual Report on R&D
- Slovak Government (2015): 'The 2014 Annual Report on R&D
- Slovak Ministry of Education, Science, Research and Sports (2016): Strategic document for passing the ex-ante conditionality in Thematic Target 1 and report on implementation of the Action Plan for the RIS3 document in 2014-2020
- Slovak Ministry of Education, Science, Research and Sports (2016): Information on International Co-operation in Science and Technology in 2015
- Slovak Ministry of Education, Science, Research and Sports (2016): Breakdown of state budget subsidies to public universities for the year 2016
- Slovak Research and Development Agency (2014): The 2013 Annual Report
- WEF, World Economic Forum (2016): The Global Competitiveness Report 2015–2016

List of abbreviations and definitions

BERD	Business Expenditures for Research and Development
EIS	European Innovation Scoreboard
ECS	Electronic Contract System
ESIF	European Structural and Investment Funds
ESFRI	European Strategy Forum on Research Infrastructures
ESIF	European Structural and Investment Funds
EU	European Union
FDI	Foreign Direct Investments
GBAORD	Government Budget Appropriations or Outlays on R&D
GERD	Gross Domestic Expenditure on R&D
HEI	Higher education institutions
HEIs	Higher education institutions
KEGA	KEGA Grant Agency
MESRS	Ministry of Education, Science, Research and Sports
NRP	National Reform Programme
MNC	Multinational company
PCT	Patent Cooperation Treaty
PRO	Public Research Organisations
OECD	Organisation for Economic Co-operation and Development
OPRI	Operational Programme Research and Innovation
R&I	Research and innovation
RIS3	Research and Innovation Strategies for Smart Specialisation
SAS	Slovak Academy of Sciences
SBA	Slovak Business Agency
SGCSTI	Slovak Government Council for Science, Technology and Innovation
SRDA	Slovak Research and Development Agency
VEGA	VEGA grant agency
WIPO	World Intellectual Property Organisation

Factsheet

	2009	2010	2011	2012	2013	2014	2015	2016
GDP per capita (euro per capita)	11800	12400	13000	13400	13600	13900	14400	
Value added of services as share of the total value added (% of total)	62.72	61.96	61.11	61.09	62.96	61.13	61.52	
Value added of manufacturing as share of the total value added (%)	17.73	20.81	21.06	20.85	20.22	21.88	22.45	
Employment in manufacturing as share of total employment (%)	21.77	21.27	21.73	21.57	21.42	21.55	21.64	
Employment in services as share of total employment (%)	63.87	64.58	64.68	65.28	65.4	65.65	65.84	
Share of Foreign controlled enterprises in the total nb of enterprises (%)	5.57	0.9	0.99	0.83	0.8			
Labour productivity (Index, 2010=100)	95.1	100	101.7	103.6	107	108.9	111.3	
New doctorate graduates (ISCED 6) per 1000 population aged 25-34	1.48	2.09	1.35	1.89	1.8	1.84	1.65	
Summary Innovation Index (rank)	27	27	27	27	27	27	27	
Innovative enterprises as a share of total number of enterprises (CIS data) (%)				34		31.8		
Innovation output indicator (Rank, Intra-EU Comparison)			15	17	16	14		
Turnover from innovation as % of total turnover (Eurostat)		23.3		19.6				
Country position in Doing Business (Ease of doing business index WB)(1=most business-friendly regulations)						29	29	33
Ease of getting credit (WB GII) (Rank)						34	39	
EC Digital Economy & Society Index (DESI) (Rank)						20	20	21
E-Government Development Index Rank		43				51		67
Online availability of public services – Percentage of individuals having interactions with public authorities via Internet (last 12 months)	38	50	48	42	33	57	51	48
GERD (as % of GDP)	0.47	0.62	0.66	0.8	0.82	0.88	1.18	
GBAORD (as % of GDP)	0.36	0.38	0.46	0.41	0.39	0.38	0.36	
R&D funded by GOV (% of GDP)	0.24	0.31	0.33	0.33	0.32	0.36	0.38	
BERD (% of GDP)	0.19	0.26	0.25	0.33	0.38	0.32	0.33	
Research excellence composite indicator (Rank)				20				
Percentage of scientific publications among the top 10% most cited publications worldwide as % of total scientific publications of the country		5.33	5.21	5.61	5.35			
Public-private co-publications per million population	11.15	14.28	12.98	10.55	7.39	8.12		

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